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A study of aggression in small groups as a function of provocation.

Kendall Wayne Toney
University of Massachusetts Amherst

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A STUDY OF AGGRESSION IN SMALL GROUPS
AS A FUNCTION OF PROVOCATION

A Thesis Presented

By

KENDALL W. TONEY

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University of Massachusetts in
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June 1969

Clinical Psychology


A STUDY OF AGGRESSION IN SMALL GROUPS AS
A FUNCTION OF PROVOCATION


A Thesis

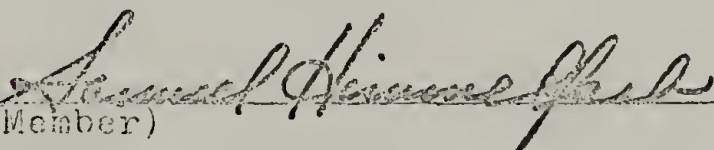
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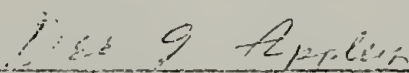
KENDALL W. TONEY

Approved as to style and content by:


(Chairman of Committee)


(Head of Department)


(Member)


(Member)

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TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION.....	1
METHOD.....	18
Subjects.....	18
Apparatus.....	18
Procedure.....	20
RESULTS.....	24
DISCUSSION.....	39
REFERENCES.....	50

LIST OF TABLES

Page

Table 1	Analysis of variance of the mean aggression settings of the subjects for blocks of five trials, on trials 1-10.....	25
Table 2	Analysis of variance of the mean aggression settings of the subjects for blocks of five trials, on trials 11-30.....	28
Table 3	Analysis of variance of the mean aggression settings of the subjects for blocks of five trials, on trials 1-40.....	30
Table 4	Analysis of variance of the mean aggression settings of the subjects for blocks of five trials, on trials 31-40.....	32
Table 5	Analysis of variance of the differences between the mean aggression settings of each subject for trials 1-10 and trials 31-40.....	36
Table 6	Analysis of variance of the mean shock thresholds for all subjects.....	38

LIST OF FIGURES

	<u>Page</u>
Figure 1 Subjects' mean aggression settings as a function of successive blocks of trials and provocation level, on trials 1-10.....	26
Figure 2 Subjects' mean aggression settings as a function of successive blocks of trials and provocation level, on trials 11-30.....	29
Figure 3 Subjects' mean aggression settings as a function of successive blocks of trials and provocation level, on trials 1-40.....	31
Figure 4 Subjects' mean aggression settings as a function of successive blocks of trials and provocation level, on trials 31-40.....	34
Figure 5 Subjects' mean aggression settings as a function of pre-post blocks of trials and provocation level, on trials 1-10 and 31-40.....	37

INTRODUCTION

There is an obvious need to systematically investigate human aggression. This need has been underscored recently by unexpected outbreaks of violent behavior among certain individuals and groups in our society. The general public has sought explanations for such aggression from experts in the fields of the social sciences and mental health. Explanations have been given, but these explanations have often been based more on theoretical notions or clinical judgments than on research findings. There is no lack of research on aggression, but many of the studies have little application to human behavior because of the inherent difficulties encountered in investigating this class of behavior.

Aggressive behavior is particularly difficult to study because there are social prohibitions against the expressing of aggression. Most persons feel justified in behaving in an aggressive manner only under special circumstances, such as in self-defense or in time of war. Thus, the investigator of human aggression must elicit behavior which is typically anti-social, while maintaining the face validity of his experimental procedure.

There are two principal methodological issues involved in studying aggression: How to elicit it and how to measure it (Buss, 1961). Several different approaches have been employed

as methods of eliciting aggression. Some investigators have openly admitted the unreal and artificial nature of the laboratory setting, and nevertheless attempted to study aggression using a technique such as role playing. Their expectation was that the subject would get caught up in the experimental situation, as is supposed to occur in psychodrama, and would begin to react with behavior related to his behavior outside the laboratory. One study which is representative of this model was conducted by Buss and Folliart (1958). They had college students act out the following situation: "We are two acquaintances. I have been gossiping about you, talking behind your back. I called you a hot head and a cheat and said you are completely dishonest and unreliable. You heard about this, and since, of course, it is not true, you are very angry. Now you are confronting me." The difficulty with this approach is that the investigator's expectations are clearly stated. The subject is thus provided with a response set to behave in an aggressive manner and there is no guarantee that his behavior will ever become more than role playing. Thus, although the expected aggressive behavior will probably be displayed by most subjects, this behavior may have little relationship to how the subjects behave outside the laboratory.

Other investigators have attempted to utilize a different approach to eliciting aggression, one in which the subject is typically frustrated or verbally attacked by either

the experimenter or one of his accomplices. This attack is made to appear incidental and unrelated to the experimental situation. Therefore, if the subject becomes aggressive in response to being provoked, this aggression has no relationship, as far as the subject is concerned, with the study in which he is participating, and should be representative of how he usually behaves under similar circumstances. In one such study (McClelland and Apicella, 1945), the experimenter was a student who was at least casually acquainted with all the subjects in the experiment. To elicit the aggression of his subjects, he first failed them on a task and then berated them with such remarks as: "You're the worst I've had yet!, You're ruining my whole experiment!" This form of aggression apparently was an effective catalyst for aggression, since the authors report that 40% of the subjects' responses fell into a combined anger-aggression category. What is somewhat troublesome about this particular experimental approach is that the amount of provocation used to elicit aggressive responses by the subjects is, at best, poorly controlled and is not easily quantifiable along any dimension of intensity. Thus it is virtually impossible to compare the different types of provocation used by different investigators, except in their ability to elicit aggression. Even in this case, we must rely on the diverse kinds of measures of aggression which have been used.

The question of how aggression is measured is of central importance to the investigation of this type of behavior. Since physical aggression must be limited in a laboratory setting, and verbal aggression is difficult to measure, indirect measurement of aggression has been a prevalent assessment technique. One such technique utilizes self-report of aggressive feelings as a measure of a subject's aggression. Feshbach's study (1955) is illustrative of this approach. He first insulted his subjects to provoke their aggression. He later inquired into their attitude toward the experiment, the experimenter, his competence, and the likelihood of their volunteering to again be a subject in a similar experiment. The difficulty with such an approach is that it is rather easily faked, since the questions are usually straightforward inquiries into the subject's aggressive feelings. There is also some question as to the relationship between self-reports of aggression and the actual physical aggressive tendencies of a person.

The other major means of the indirect measurement of aggression has been the use of projective techniques. A study by Gluck (1955) is an example of this approach and is especially relevant because he attempted to relate aggression on the Rorschach to the subject's aggressive responses to frustration in a laboratory setting. The subjects in this study were male psychiatric patients in an army hospital. Each subject was first given a Rorschach and then placed in a series of extremely frustrating situations where his aggressive behavior was rated.

A factor analysis of the frustrating tasks yielded three factorally pure tasks, and the behavioral aggression score was the average rating for these three tasks. The Rorschach was scored for "overt" aggression (two people in a duel) and "covert" aggression (spears, bat with a torn wing). Then behavioral aggression was correlated with overt, covert, and total Rorschach aggression. None of the correlations were significant, and these results seemed predictable. It may have been unreasonable for Gluck to expect a significant relationship between two quite different dependent measures of aggression: behavioral aggression as measured by the changes in a subject's behavior following the experience of frustration, and aggression as a personality trait as measured by certain Rorschach variables.

In answer to many of the questions raised by the research on aggression, Buss (1961) designed an apparatus appropriately dubbed an "aggression machine." Using this machine, he developed a technique of experimentation which provides a means of directly measuring aggression. The unique feature of this technique is that it provides a mode of aggression which can be quantified, that mode being the delivery of electric shock. Buss suggests that aggression has two components: (1) the delivery of a noxious stimulus from one organism to another, and (2) an interpersonal context. His technique encompasses both of these components.

In a typical experiment using this apparatus and technique, a subject was instructed to act as an experimenter in a

learning experiment. He was to administer an electric shock to the subject of the learning experiment whenever he responded incorrectly. This second "subject" was actually an experimental accomplice who responded in a predetermined manner. The purpose of the experiment was presented as an investigation of the effect of the sex and personality of the experimenter upon conceptual learning. The subject chose one of ten possible shock levels to administer to the accomplice following each incorrect response. So that the subject could understand how much shock was represented by the ten buttons, the electrodes were attached to him and he was administered shock from buttons 1, 2, 3, and 5. He was then informed that the intensity of the shock continued to increase to button 10. The shock level was set so that 1 was slightly above touch threshold, and was essentially a signal to the accomplice that his response was incorrect. The intensity of the shock became painful as it increased through levels 2 and 3, and at level 5 it was an extremely noxious stimulus. The subject thus learned that the lowest shock level was basically a signal, and the higher levels were painful.

Before beginning the experiment, the subject was given a sequence that would randomly present patterns of lights to which the accomplice was to respond. Following his exposure to the shock, he was ready to run the accomplice. The subject set up the pattern of lights indicated for the first trial, noted the accomplice's response, and then pressed the "correct" button or administered a shock of whatever intensity he chose.

However, the accomplice was never really shocked, because he had disconnected the electrode attached to him by throwing a hidden switch.

Buss believes that the intensity of the shock delivered by the subject is an index of aggressiveness, and that more aggressive subjects will select higher intensities of shock. Thus, in this experimental situation, the subject had the opportunity to aggress against another person without fear of retaliation or concern for ethics, especially since his behavior was being approved of by the experimenter, if only implicitly so. Considering Buss' theoretical position that the two major classes of antecedents to aggression are frustration and noxious stimuli, including attack and annoyers (Buss, 1961), it seems unusual that he provided no means of eliciting aggression in the above study by either frustrating, annoying or attacking the subjects. What does seem to occur in this experimental model is that the subjects are allowed to aggress with no fear of reprisal, a situation far removed from reality in most circumstances. Thus, their behavior may not be representative of how they would react under different circumstances, in which their behavior might lead to some form of retaliation by their "victims."

Milgram (1965) has used a technique similar to that of Buss, but he seems to provide a more realistic setting for the evaluation of aggressive behavior. Although his primary interest was to study obedience, reaction to authority, and

group pressure, Milgram, nevertheless, demonstrated some of the parameters which can influence a person's aggressiveness. In general, Milgram used Buss' experimental procedure. Each subject was told that he was to train another subject in a conceptual learning task by administering an electric shock to him for each incorrect response. The second subject was actually an experimental accomplice who responded in a predetermined manner. The first subject had no control over the intensity of shock being administered. Each time he administered a shock, the shock intensity increased a specified amount. There were thirty levels of shocks altogether. The subject's only control over the administration of the shock was his decision to continue or terminate his participation in the experiment. Milgram's accomplice was a professional actor whose behavior during the experiment was related to the amount of shock he supposedly was receiving. Thus, as the intensity of the shocks increased, the accomplice first made mild protests which evolved into loud demands for the subject to stop giving the shocks, and finally pleas that he was experiencing great physical pain. Actually the accomplice received no shocks. The subject, in effect, was being asked to give increasing amounts of shock to a person who was pleading and demanding that he stop. One particular study (Milgram, 1965) involved three parts. In experiment I, subjects were instructed to administer increasingly more severe shocks to an accomplice for every incorrect response he made. As long as the subject remained a participant in the experiment,

he was required to be aggressive. The only manner in which he could stop his aggression was to refuse to continue. However, when a subject expressed a desire to discontinue before the completion of the series of thirty shocks, the experimenter demanded that he continue. In this case, 26 of the 40 adult male subjects administered the entire thirty shocks, thus overriding temporarily whatever concerns they might have felt about continuing to shock a person who was apparently experiencing great pain. Milgram, in another study (Milgram, 1964) had found that the administering of higher levels of shocks was atypical. The subjects in this study were allowed to administer any level of shock they wished, and they administered significantly lower average levels of shocks than the subjects in the above experiment who were under pressure from the experimenter to continue. It thus appears that subjects will behave in a more aggressive manner than is typical for them if they have no expectation of reprisal from their victim, and if the only alternative to continuing to be aggressive is to face the wrath of the experimenter.

In experiment II, Milgram attempted to assess the effect of group pressure upon the subject's behavior. In this case, two accomplices shared with the real subject the responsibility for administering shocks to the victim, the third accomplice. At shock levels 10 and 14 respectively, one of the two accomplices refuses to continue the shocking because of the protests of the third accomplice, and he moves to

another part of the room, refusing to return to the experimental apparatus. Thus, by shock level 15, the subject has witnessed the successful defiance of the experimenter's authority and demands by two of his fellow subjects, and if the shocking is to continue, he must go on alone. Milgram wanted to determine if the group pressure exerted by the two accomplices' defiant behavior would have any effect on the subjects' behavior. Whereas, in experiment I, 14 of the 40 subjects defied the experimenter's demands that they continue, in experiment II, 36 of the 40 subjects refused to complete the shock series, clearly indicating the group influence. What seemed to be most important in this experiment was the subjects' observation that the defiance of the experimenter had no dire consequences. Also, it was clearly illustrated that the administering of high levels of shock was an undesirable behavior, since the other two subjects withdrew from the experiment.

In experiment III, Milgram attempted to influence the subjects to be compliant with the experimenter's demands by having the two accomplices as in the previous experiment, except that now their behavior was a passive compliance to the demands of the experimenter. His results indicated no significant increase in the number of subjects who completed the shock series in this group when compared to the group of subjects who were simply commanded by the experimenter to continue when any subject expressed a desire to stop. Thus the group pressure, having been exerted through the absence of any defiant behavior

by the two accomplices, did not provide a significant influence beyond that provided by the experimenter. Although Milgram's primary focus was not on studying aggression, he nevertheless demonstrated how individuals can be influenced to exhibit more aggressive behavior than they would under normal circumstances when the alternative to being aggressive is facing the disapproval and wrath of an experimenter. He also showed that a person's peers can influence his behavior through the application of group pressure.

Milgram's study of group influence over aggressive behavior leads to the interesting question of how individuals would behave in a group in which they were all asked to make aggressive responses toward each other. This paradigm would eliminate the accomplices used by Milgram, and every subject would both administer and receive noxious stimulation. Ginsberg (1966) did such a study. She used the basic Buss procedure with some modifications, and she attempted to determine how a group of individuals would behave when they were asked to aggress against each other. Her experimental paradigm and her hypotheses stemmed primarily from an observation of group behavior reported by Skinner (1953), concerning a common practice which occurred on eighteenth century sailing ships.

Sailors would amuse themselves by tying several boys or younger men in a ring to a mast by their left hands, their right hands remaining free. Each boy was given a stick or whip and told to strike the boy in front of him whenever he felt himself being struck by the boy behind. The game was begun by striking one boy lightly. This boy then struck the boy ahead of him, who in turn

struck the boy next ahead, and so on. Even though it was clearly in the interest of the group that all blows be gentle, the inevitable result was a furious lashing. (Skinner, 1953, p. 309)

Ginsberg expected that the administration of any shock level above the lowest level would be perceived by the recipient as an attack and would lead to further aggression resulting in the eventual spiraling of aggression. This expectation was in agreement with Buss' hypothesis that: "The antecedent event most likely to elicit aggression is an attack" (Buss, 1961, p. 38). To test her hypothesis, Ginsberg set up an experimental circle of aggression. Groups of three male college students were run at each session in what they were told was a reaction time study. Each subject administered shocks to the person on his right and received shocks from the person on his left, thus creating the circle of aggression. Each subject had the option of selecting any of the five levels of shock to administer to his neighbor, each level being below this neighbor's pain threshold which was established before the experiment began. Level 1 was 25% of this threshold, level 2 was 50% of this threshold, level 3 was 70%, level 4 was 80%, and level 5 was 90% of this threshold. The subjects were assigned two possible conditions which varied the amount of information they received regarding the level of shock they were administered. One half of the groups received both visual feedback on their experimental panels and the tactile sensation of the shock itself as means of identifying the

intensity of the shock they had received. The other half of the subjects received the shocks, but were not given any visual feedback.

Ginsberg hypothesized that the levels of shock selected by each subject would increase steadily over trials in a spiraling manner, and also that the groups receiving both visual and tactile information regarding the level of shock they had received would respond with less variability than the remaining groups.

Ginsberg's results did not support her hypotheses. She suggested several reasons to explain the lack of spiraling in the subjects' choices of shock levels. One problem was the size of the groups which meant that each trial of one shock per subject was completed in about one minute. She felt that the threat of immediate retaliation could have inhibited the subjects' aggressiveness. Another problem seemed to be the intensity of the shocks administered, as many subjects reported being unable to feel the lower level shocks. Thus many of the subjects may have escaped the aggressive intent of their neighbor on many trials. Another difficulty in this study was the limited number of choices of levels of aggression. In other words, is it possible to obtain a spiraling effect when there are only five possible levels of choice?

Mendelsohn (1968) attempted to remedy many of the inherent problems in Ginsberg's design and procedure, and also to investigate the effect of group size upon aggression

within the group. He first increased the intensity of the levels of shock to be given and also the duration of each shock to increase the likelihood that each shock would be perceived by the subject. The shock levels were increased to 50%, 70%, 80%, and 90% of the shock threshold, and the duration of each shock became seven-tenths of a second. He also doubled the number of choices of levels of aggression from five to ten. He was able to do this by computing an average pain threshold for each group of subjects, and setting the ten levels on the basis of this group average. Levels 1, 2, and 3 were actually 50% of this threshold, levels 4, 5 and 6 were 70%, levels 7, 8 and 9 were 80%, and level 10 was 90% of this threshold. He also moved the experimenters out of the experimental room where the subjects were, in hope of reducing the social prohibitions felt by the subjects toward the expressing of aggression. Mendelsohn had 48 subjects, all of them college males. He ran five groups of three subjects each, and five groups of five subjects each. His twenty-five trial procedure was the same as that used by Gansberg except for the changes noted above. He hypothesized that the subjects would steadily increase the level of shock they chose in a spiraling effect, and also that the three subject groups would exhibit a less aggressive response pattern than the five subject groups.

Mendelsohn's results did not support his hypotheses, and he offers a possible explanation for the lack of spiraling in the subjects' choices of levels of shock. Since the subjects had to administer and receive shocks, they may have

operated under an attitude set to keep the intensity they administered and received at a low level. He speaks of an attitude set, but this behavior could also have been called a rational solution to a potentially unpleasant experience. In other words, the major factor which seems to be missing in both Ginsberg's and Mendelsohn's studies is any instigation or provocation of the subjects to be aggressive. Both Ginsberg and Mendelsohn based their hypotheses primarily on Skinner's report of the behavior aboard eighteenth century sailing ships. While it is not possible to dispute the report made by Skinner, an alternative explanation to his report that the aggressive behavior occurred spontaneously and without reason is possible. Another explanation is that there was an expectation among the older sailors, i.e., the audience, that the severe beatings would occur among the younger sailors. Thus, possibly to display their bravery or to avoid the consequences of not behaving in an "entertaining and aggressive" manner, the young sailors exhibited the reported spiraling of aggression. While this explanation is merely conjecture, it is apparent in the studies of Ginsberg and Mendelsohn that their subjects had little reason to be aggressive. They, indeed, seemed to be considering their own welfare in keeping the shock levels low.

Taylor (1965) did a study in which he had subjects supposedly competing with another, the winner of each reaction time contest being able to choose a shock level to administer to his opponent. Although no opponent existed, the subjects

were reported to get caught up in the competitive and aggressive situation. In one paradigm, using this procedure, the subjects repeatedly received low levels of shock from their "opponent" who was, in fact, the experimenter. Taylor reports that the levels of shock chosen by the subjects for their opponents were correspondingly low. This situation seems analogous to the studies of Ginsberg and Mendelsohn in that there was no provocation to elicit aggressive responding in the subjects. In another report, Taylor (1965) had provocation as one of the conditions in his study. He gradually increased the shock settings of the "opponents" over blocks of trials and he found that the subjects' choice of shock level closely matched the level of provocation being administered at the time.

The present investigation was designed as an attempt to investigate the effect of provocation upon a group of subjects, each of whom will experience the provocation as emanating from the person who is giving him shocks. The study will thus provide an experimental situation in which the basic experimental procedure used by Mendelsohn will be utilized with the following additions. Only groups of three subjects will be run, since Mendelsohn found no differences in the behavior of groups of five subjects and groups of three subjects. The number of trials will be increased from 25 to 40, the first ten trials being operant trials, trials 11-30 being experimental trials. The first and last ten trials will be run in the same manner as all of the trials in both Ginsberg's

and Mendelsohn's studies. During the twenty experimental trials, the level of shock administered to each subject will be the same for all trials, and will be based on the level of provocation to which his group has been assigned. The three levels of provocation are designated as Low, Medium and High.

In general, the expectation of this study is that the groups will closely match the level of shock administered to them during the experimental trials, and that the Low, Medium and High groups will differ significantly in their mean aggression levels during these trials. Also the mean aggression levels of all groups should be significantly higher during the last ten trials than during the first ten trials.

METHOD

Subjects

The subjects were 45 male undergraduates at the University of Massachusetts. For participating in this experiment, each subject was paid \$1.50 or given one credit toward the experimental requirement in his undergraduate psychology course.

Apparatus

The major apparatus consisted of the subjects' panels and the experimenter's control board which were placed in adjacent rooms connected by an intercom and a one-way vision mirror. The experimenters were thus able to observe the subjects and also hear any sounds in the experimental room. There was a panel for each subject, and each panel was placed in a separate booth so that during the experimental procedure, the subjects could not see each other.

Located on each subject's panel was an amber light labeled READY, a green light labeled RESPOND, a toggle switch labeled RESPONSE BUTTON, ten other toggle switches arranged in two horizontal rows of five each and labeled in sequence from "1" (one) to "10" (ten), and a small plastic window which covered a digital display on which the numbers one ("1") to ten ("10") could be illuminated.

The experimenters' control board consisted of a metal frame on which was mounted one experimental panel for each

subject's panel, a shock apparatus, a telegraph key, and a Hunter timer. On each of the experimental panels was located a toggle switch labeled READY, which was wired to the subject's amber READY, another toggle switch labeled RESPOND which was wired to the subject's green RESPOND light, a red jewel light which was wired to the subject's toggle switch labeled RESPONSE BUTTON, ten toggle switches labeled "1" to "10," all of which were wired to the subject's digital display, and a digital display which was wired to the ten toggle switches on the subject's panel. A Tursky Constant Volt Shock Apparatus for Human Subjects was also mounted on the experimenter's control board. A selector switch labeled "1" through "5" was connected to the Tursky apparatus, and each position on the switch was wired to a subject's electrode and connected him to the shock apparatus when the switch was placed at his position. A shock was administered when the experimenter pressed the telegraph key. The key was wired both to the Tursky apparatus and a Hunter timer which held the duration of each shock at a constant seven-tenths of a second. The remaining apparatus consisted of a concentric electrode (see description in Tursky, Watson, and O'Connell, 1965) and felt electrode pads. The concentric electrodes were used to deliver the shocks to the subjects, and one electrode was attached to the outside forearm of each subject.

Procedure

Three subjects were run as a group at each experimental session. The level of provocation which the groups received was randomly assigned. At the time the students volunteered, they were told that they would be participating in a study of reaction time. Before the subjects were taken to the experimental room, they were read a standard sheet of instructions by one of the two experimenters who were present throughout the experiment. These instructions were as follows:

Introductory Instructions

In the experiment that you are about to participate in, we are interested in examining the performance of people in a small group situation. In particular, we are examining your reaction time, that is how fast you can do a particular activity. During part of the experiment, mild electrical stimulation will be given. We want it fully understood that this stimulation will be quite mild, and in no case will it be harmful or even painful. In order to be sure that this stimulation is not painful, you will be individually tested to determine how much of this stimulation you would perceive as being uncomfortable.

Then each subject, in turn, was escorted by one of the experimenters to the experimental room where he was seated in a booth, and the concentric electrode was attached to his arm. After the subject's basal skin conductance was established within the limits of the shock apparatus, his pain threshold was determined. With one experimenter in the experimental room with the subject, the other experimenter administered shocks to the subject using an ascending method of limits technique beginning at 5 milliamperes. Shock intensity was

gradually increased until the subject said "Stop" as an indication that the shock level he had just experienced was definitely uncomfortable. His pain threshold was established at this point, and the testing stopped.

After the three subjects' pain thresholds had been determined, each subject was handed a sheet of standard experimental instructions. The instructions were the following:

Instructions

(Please read these instructions carefully, hold all your questions until the experimenter asks for them, just before the beginning of the experiment.)

If you will look at the panel in front of you, you will see a number of lights, switches, and a small plastic window in the center of the panel. We will explain each of these one at a time.

The switches labeled "1" through "10" refer to the shock levels which you will give to your neighbor on your RIGHT. You will give this shock by depressing the switches--one is the weakest, ten is the strongest. At the small plastic window in front of you, numbers will appear--from "1" to "0"(ten)--indicating the shock level that you are about to receive, from the person on your LEFT. The appropriate number will light on your panel just as you are to receive the shock.

The sequence of events is as follows: You will do nothing until the READY light (the amber one on your panel) goes on. When this occurs, you will select the level of shock that you wish to give to the person on your RIGHT, and depress the switch under that number. Be sure to hold the switch down for a few seconds. You should then get ready to respond by putting your finger on the RESPONSE BUTTON. When the RESPOND light goes on (the green light on your panel) you are to press your RESPONSE BUTTON down as quickly as possible. You may then release the switch and await your next turn.

Just before your next turn, the person on your LEFT will be going through his turn. In this case, you are the one who will be receiving the shock. You will be able to determine what level of shock he gave you by the feel of it and by the number appearing in the window of your panel equal to the level of shock he chose for you. Your READY light (amber) will come on soon after this, and we will begin another sequence.

When all the subjects had completed reading the instructions, they were given an opportunity to ask questions concerning the experimental procedure. All the questions were answered by referring to the appropriate section of the printed instructions. As the subjects read the instructions, one of the experimenters was computing the average pain threshold for the three subjects, and setting the ten levels of shock based on the group's average. The levels were as follows:

Level 10 - 90% of the average group threshold

Levels 7,8,9 - 80% of the average group threshold

Levels 4,5,6 - 70% of the average group threshold

Levels 1,2,3 - 50% of the average group threshold

The above procedure was followed because it was felt that the individual thresholds within a group would not differ significantly (see Mendelsohn, 1968, p. 39).

Each of the groups of three subjects was randomly assigned to one of three possible levels of provocation: High, Medium, and Low. Each group was run through 40 trials, trials 1-10 being operant trials, trials 11-30 being experimental trials, and trials 31-40 being post experimental trials. The general sequence for each trial was as follows: E gave S1 the READY light. S1 chose the level of shock he wished to give to S2, and then pressed the appropriate switch which could be labeled from "1" to "10". E recorded the level S1 chose, set the appropriate shock level for S2, and then gave S1 the RESPOND light. S1 pushed the RESPONSE BUTTON switch,

and E gave the shock to S2, while simultaneously illuminating the appropriate number on S2's digital display for the level of shock he was receiving. This procedure then continued with S2 choosing a shock level for S3, then S3 for S1, etc.

This procedure was strictly followed during the first and last ten trials, but was modified during the twenty experimental trials, 11-30. However, the subjects had no reason to believe that the experimental trials were different from the trials that preceded or followed them. Each subject continued to choose levels of shock to administer to his neighbor, make responses, and receive shocks himself. However, during the experimental trials, the level of shock received by the subjects was always the same, and was determined by the level of provocation to which the group had been assigned. The following three levels were possible:

Low: 50% of the average group pain threshold

Medium: 70% of the average group pain threshold

High: 80% of the average group pain threshold.

RESULTS

Aggression was measured by the intensity of shock that a subject chose for his neighbor to receive. Scores consisted of the mean aggression setting for each block of five trials. To determine if the subjects assigned to each of the three levels of provocation differed significantly in their choices of aggression levels prior to the beginning of the provocation procedure, a repeated measurements analysis of variance (Myers, 1966) was carried out on the subjects' scores for the initial two blocks of five trials. These first ten trials constituted the operant trials. The results of this analysis are found in Table 1. None of the effects were significant, and thus there were no significant differences in the mean aggression settings of the subjects in the three provocation levels for the first ten trials. ($F(A) = .59, df = 2, 42$) Figure 1 shows the means of the scores of the subjects in each provocation level during the operant trials. Although the mean scores of the subjects in the Low provocation level generally fall below the mean scores of the subjects in the Medium and High provocation levels, these differences are not significant. Therefore, among the subjects assigned to any one of the three provocation levels, there was no response set which would significantly influence the subjects' scores during the provocation trials.

Table 1

Analysis of variance of the mean aggression settings of the subjects for blocks of five trials, on trials 1-10.

<u>Source of Variance</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>
A	7.11	2	3.56	0.59
S/A	252.90	42	6.02	
B	0.07	1	0.07	0.06
AB	0.82	2	0.41	0.34
SB/A	50.56	42	1.20	

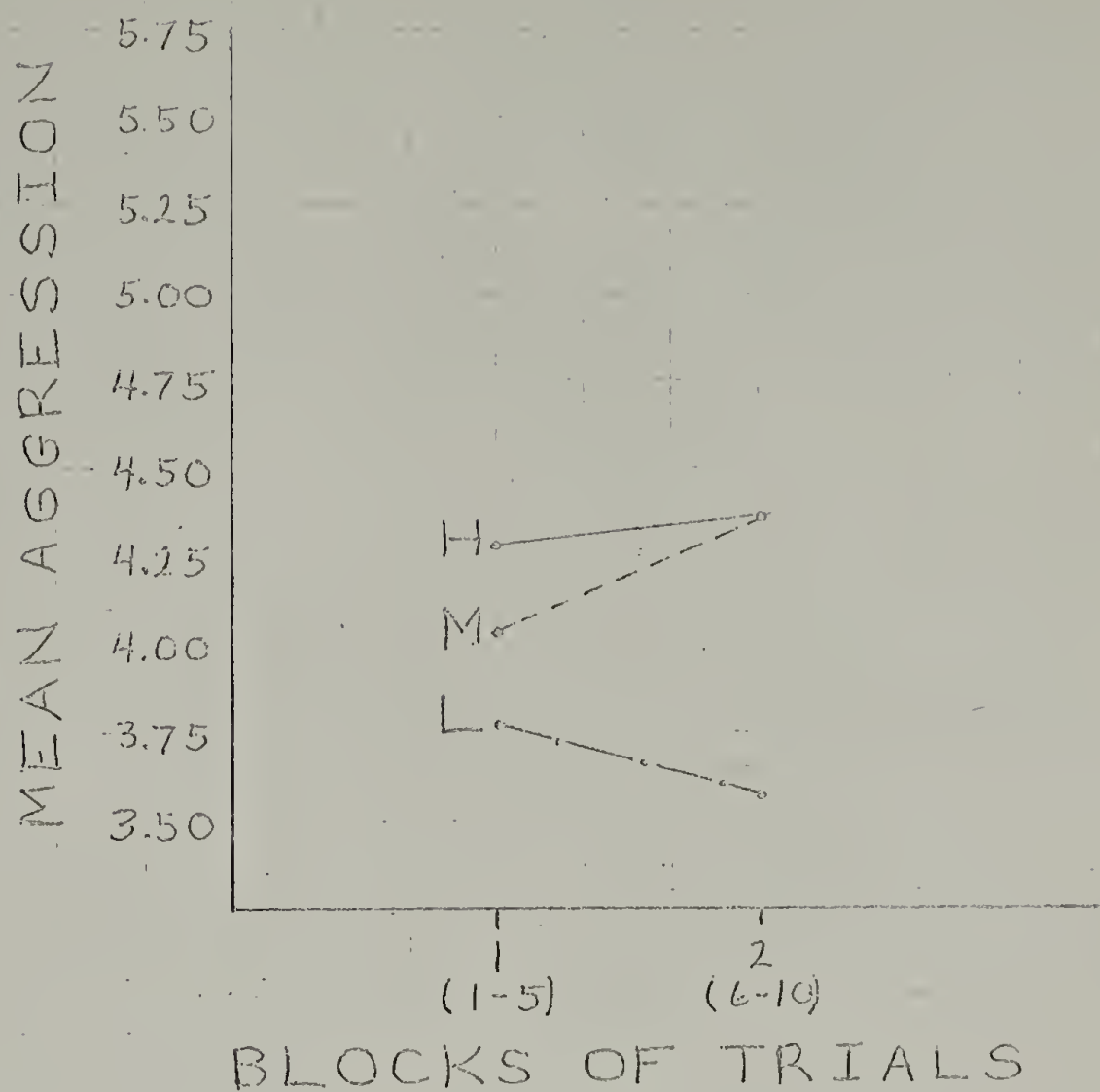


Figure 1. Subjects' mean aggression settings as a function of successive blocks of trials and provocation level, on trials 1- 10.

The following analysis involves the subjects' scores on the provocation trials, 11-30, during which each subject received the same intensity of shock on every trial, the intensity being determined by the provocation level to which his group had been assigned. The results of a repeated measurements analysis of variance of the subjects' scores on the provocation trials is summarized in Table 2. The predicted differences in the scores of the subjects in the three provocation levels were not significant. ($F(1)=2.03, df=2,42$) The mean scores of the subjects in each provocation level for the provocation trials are plotted in Figure 2. As was true during the operant trials, the rank order of the mean scores was in the predicted direction, even though the differences were not significant.

Another repeated measurements analysis of variance was carried out on the provocation trials in an attempt to reduce error variability by removing any individual response sets as indicated by each subject's first response. None of the effects of this analysis were significant.

The next analysis was performed to determine if there was a significant groups effect, and also to provide additional power in evaluating the interaction effects within the data. Therefore, a repeated measurements analysis of variance involving a hierarchical design was performed on the subjects' scores for the entire 40 trials, and the results of this analysis are summarized in Table 3. The only significant

Table 2

Analysis of variance of the mean aggression settings of the subjects for blocks of five trials, on trials 11-30

<u>Source of Variance</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>
A	63.95	2	31.98	2.03
S/A	658.78	42	15.68	-----
B	5.56	3	1.85	1.11
AB	3.16	6	0.52	0.31
SB/A	210.25	126	1.67	-----

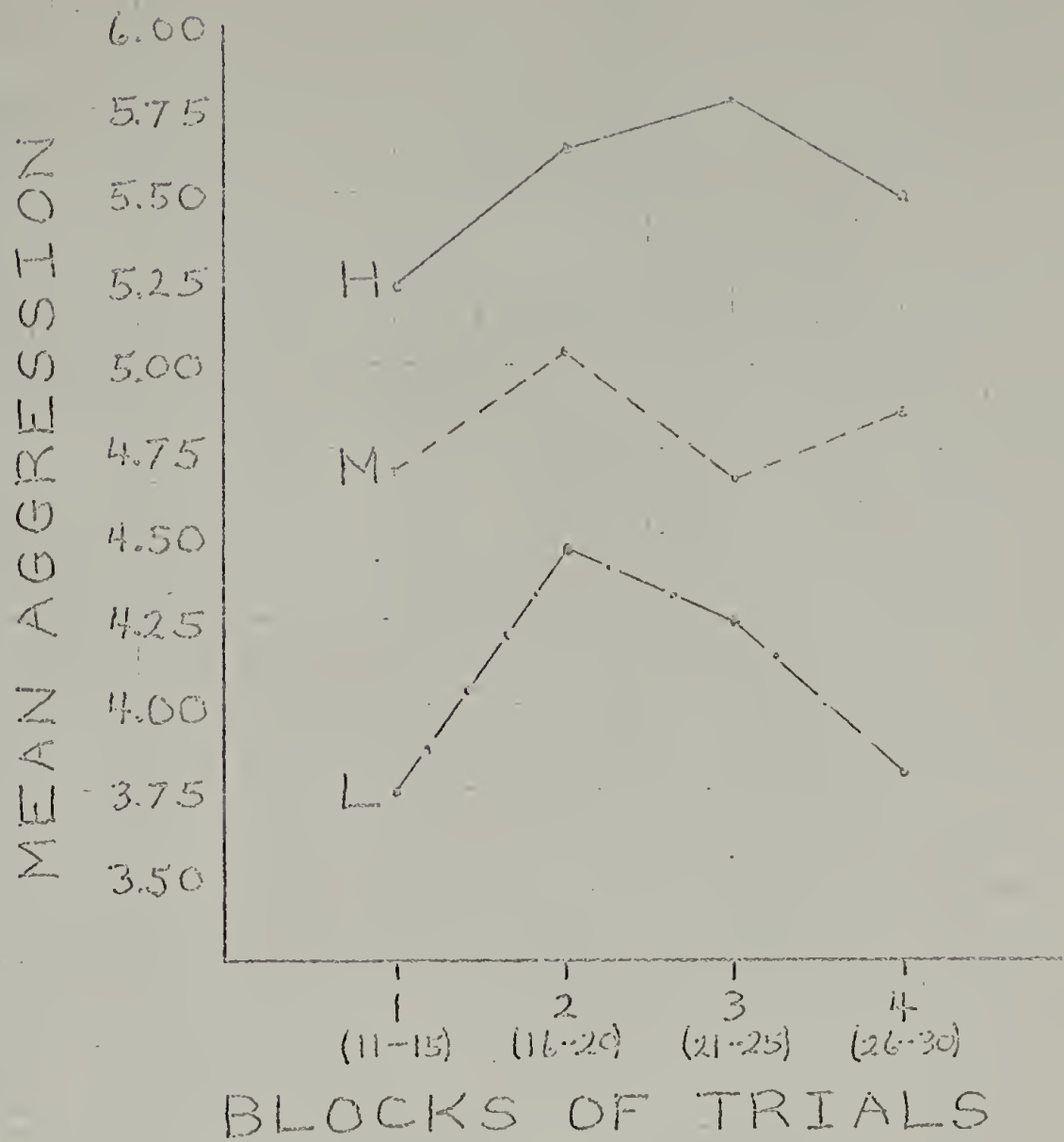


Figure 2. Subjects' mean aggression settings as a function of successive blocks of trials and provocation level, on trials 11-30.

Table 3

Analysis of variance of the mean aggression settings of the subjects for blocks of five trials, on trials 1-40

<u>Source of Variance</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>
A	65.63	2	32.87	1.56
G/A	391.63	12	32.63	1.50
S/G/A	630.903	30	21.030	---
B	41.48	7	5.925	3.16 *
AB	26.84	14	1.917	1.02
GB/A	200.28	84	2.384	1.27
SB/G/A	394.78	210	1.87	---

*
p < .01

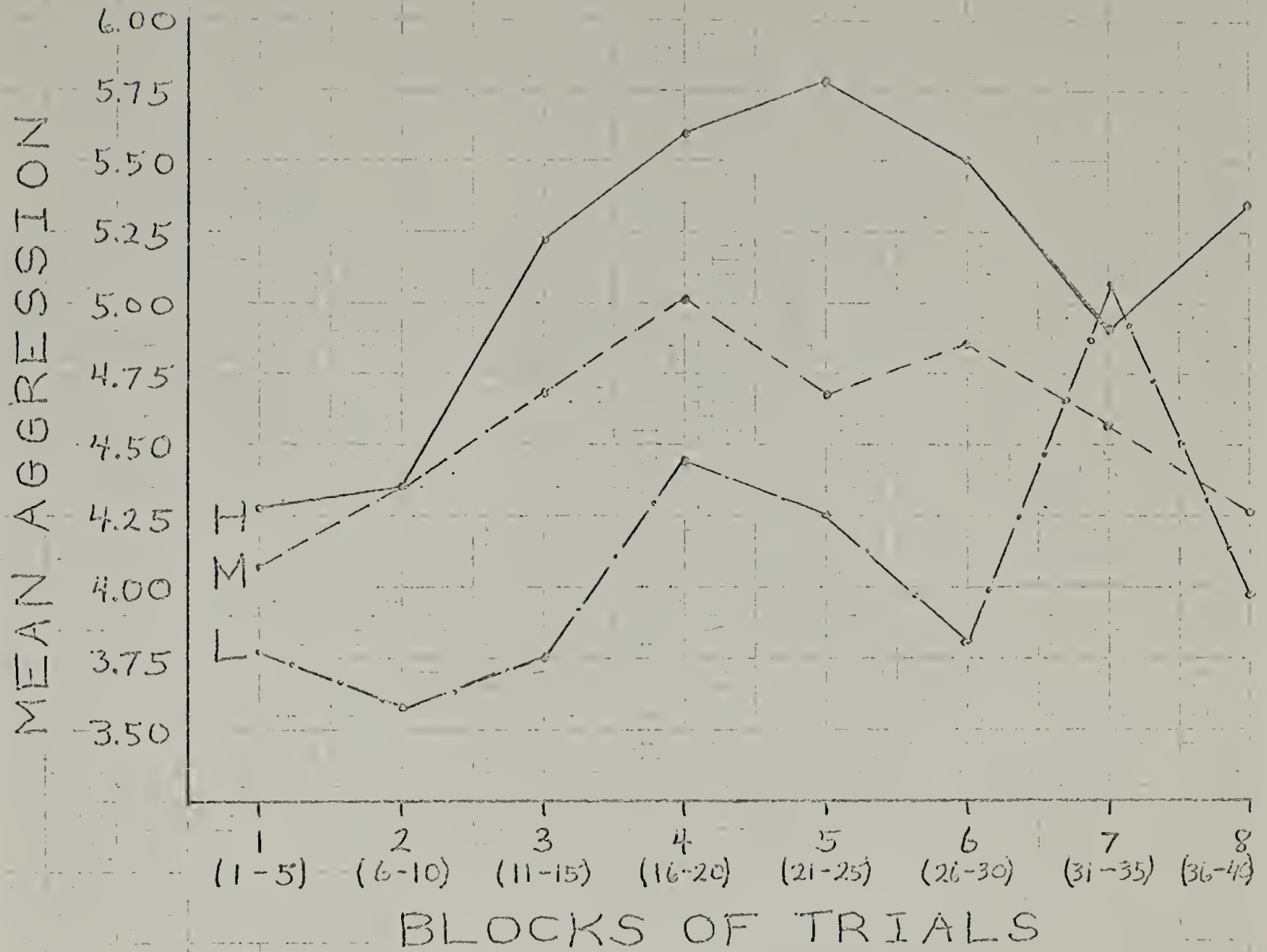


Figure 3. Subjects' mean aggression settings as a function of successive blocks of trials and provocation level, on trials 1- 40.

effect was for trial blocks, indicating that there was a significant change in the mean aggression levels of all the subjects over the 40 trials. The subjects' mean aggression scores for trials 1-40 are plotted in Figure 3.

The next analysis dealt with the post trials, 31-40, which followed the provocation trials. A repeated measurements analysis of variance of the subjects' scores for these trials was performed, and the results are summarized in Table 4. None of the effects were significant. These scores are plotted in Figure 4. Although the predicted results did not occur, an interesting shift in the rank order of the mean scores for the subjects in each provocation level occurred. The subjects who had received the Low level of provocation displayed the highest mean aggression level during trials 31-35, followed by the High provocation subjects and the Medium provocation subjects. This rank order returned to the predicted one of H-M-L for the final five trials, 36-40.

To determine if the provocation procedure led to a spiraling of aggression among the subjects regardless of the provocation condition to which they had been assigned, an analysis of variance was performed using the subjects' scores on the operant and post trials as data. It was felt that if a significant difference existed between these two sets of data, then spiraling had indeed occurred. The results of this analysis are found in Table 5. The P variable, the pre-post variable, was significant at the .01 level. ($F(P)=10.01$, $df=2,42$). Thus, there was a significant increase in the mean

Table 4

Analysis of variance of the mean aggression settings of the subjects for blocks of five trials, on trials 31-40

<u>Source of Variance</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>
A	8.91	2	4.46	0.53
S/A	360.24	42	8.57	-----
B	2.36	1	2.36	1.11
AB	8.51	2	4.25	2.05
SB/A	84.85	42	2.02	-----

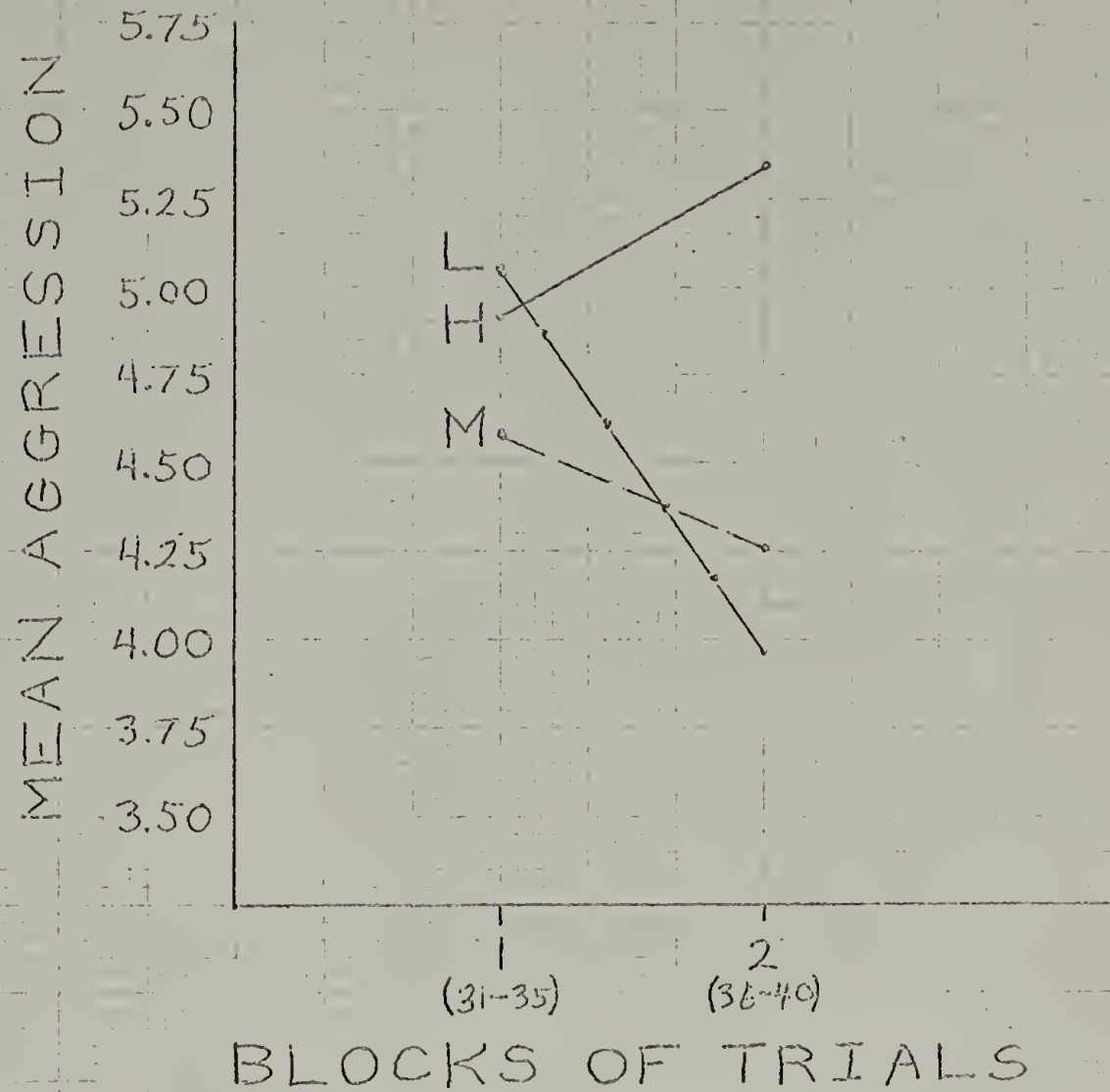


Figure 4. Subjects' mean aggression settings as a function of successive blocks of trials and provocation level, on trials 31-40.

aggression level of the subjects over 40 trials. It appears that the provocation procedure had some influence on this occurrence. The data is plotted in Figure 5.

A final analysis was carried out to determine if the shock thresholds of the subjects had an influence on the results. A simple analysis of variance was completed on the mean shock thresholds for the subjects in each provocation level. These results are summarized in Table 6. There were no significant differences between the mean shock thresholds of the subjects in any of the three provocation levels. ($F(A)=0.31, df=2, 42$).

Table 5

Analysis of variance of the differences between the mean aggression settings of each subject for trials 1-10 and trials 31-40

<u>Source of Variance</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>
A	6.10	2	3.05	0.47
S/A	271.05	42	6.45	-----
P (pre-post)	8.58	1	8.58	10.01 *
PA	1.90	2	0.95	1.13
PS/A	35.52	42	0.84	-----

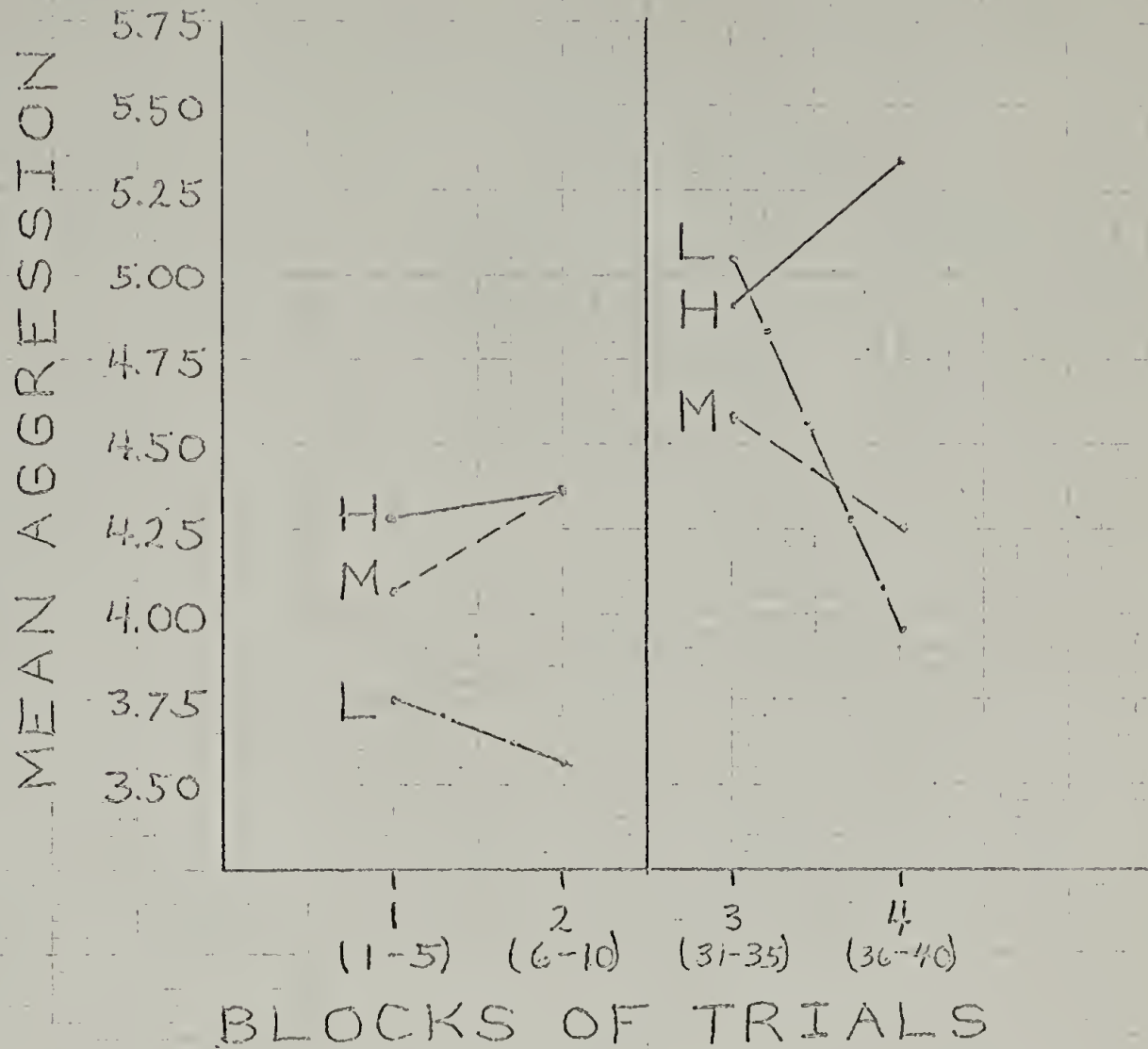


Figure 5. Subjects' mean aggression settings as a function of pre-post blocks of trials and provocation level, on trials 1-10 and 31-40.

Table 6

Analysis of variance of the mean shock thresholds for all subjects

<u>Source of Variance</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>
T	2.21	2	1.10	0.31
S/T	148.43	42	3.53	-----

DISCUSSION

Based on Buss' discussion of attack as the major instigator of aggression (Buss, 1961) and Taylor's findings regarding the influence of provocation upon aggression (Taylor, 1965), it was hypothesized that subjects in groups of three would select mean aggression levels to administer to their neighbors based upon the level of provocation received by their groups. Thus, there would be significantly different mean aggression levels between the subjects in the three provocation conditions, and the rank order of these levels would coincide with the rank order of the provocation conditions, i.e., High, Medium, and Low. This hypothesis was for both the experimental trials, 11-30, and the post trials, 31-40. An additional hypothesis was that the mean aggression levels for all the subjects during the post trials would show a significant increase over the mean aggression levels of these subjects during the operant trials.

One of these hypotheses was confirmed. The mean aggression levels of the subjects were significantly higher during the post trials than they were during the operant trials. However, the major hypothesis of this study was not confirmed - i.e., the effect of the three provocation conditions did not lead to significantly different mean aggression levels among the subjects assigned to the different provocation conditions. Figure 2 illustrates that the mean aggression levels of the

subjects in the three provocation conditions fell into the predicted order during the experimental trials, but also during the operant trials. However, as seen in Tables 1 and 2, the F ratio for the provocation effect (A) was 2.03 during the experimental trials as compared to 0.59 during the operant trials, based on the same degrees of freedom. This difference may indicate that the provocation procedure did have some influence on the subjects' mean aggression levels during the experimental trials. The next question, then, is why this effect, if present, was not found to be significant. One possibility is that the great amount of variability in the subjects' responses, along with the level of power of the analyses of variance used in this study, did not provide an adequate test of the possible provocation effect. It is clear that with the greater than anticipated variability in the subjects' responding, there should have been more than five groups of subjects for each level of provocation, thus increasing the degree of freedom and the power of the analyses of variance. Certainly any future studies involving this design and procedure should include an increased number of groups for each experimental cell.

Another possible reason for the insignificant differences between the provocation conditions during the experimental trials is what appears to be a regression to the mean phenomena in the mean aggression levels. During the entire 40 trials, the range of the mean scores for provocation groups

was only 2.2 shock levels, from 3.58 to 5.78. An examination of Figure 2 indicates that the Low subjects generally chose shock levels slightly above the level of provocation they received. Both the Medium and High subjects chose levels clearly below the levels of provocation they received during the experimental trials. The possibility of an attitude set operating during the experimental trials must be considered. The nature of this attitude set would seem to have been to control the level of aggression, since the Medium and especially the High subjects received the higher levels of shock during these trials. In effect, the High subjects, and to a lesser extent the Medium subjects, seemed to respond to aggression in a way designed to minimize the amount of further aggression they experienced. Such an attitude set might also exist among the Low subjects, but would not necessarily be displayed in their responses since they were already receiving low levels of shocks.

Epstein and Taylor (1965) discuss such an attitude set. In their study, the subjects were led to believe that they could control the amount of noxious stimulation (electric shock) they received by defeating the other subject with whom they were competing, or by keeping the shock level they administered low. There was, in fact, no opponent, and the number of times the real subject won and the intensity of shock he received when he lost were predetermined by the experimenter. Epstein and Taylor found that subjects who were

equal in ability to their "opponents," i.e., won 50% of the reaction time contests, and whose opponents did not increase the level of aggression they administered, would attempt to keep aggressivity at a constant level. In the present study, the influence of such an attitude set would seem even more likely, since the subjects could not avoid receiving a shock on every trial, and could thus only seek to control the level of shock they received, not the number of shocks. The mean aggression levels as plotted in Figure 2 seem to indicate the possibility that the Medium and High subjects not only attempted to keep aggression at a constant level, as Epstein and Taylor's subjects did, but, in fact, seemed to try to reduce the level of aggression by choosing shock levels below the level of provocation they were receiving.

For future studies, it is important that any possible attitude set of the subjects be measured, and where possible controlled, while other variables are being investigated. This need is especially great when, as in the present study, the major hypotheses are not confirmed. It is then necessary to be able to ascertain what contributed to the unexpected results. Questionnaires aimed at tapping the subject's attitude toward himself, the experimenter, the experiment, and the other subjects could be given preceding and upon completion of the experiment and give valuable information about the possible effects of his attitudes upon his scores. Controlling the subject's attitude set can be accomplished by preselecting subjects on the basis of their scores on screening

devices or by manipulating instructions. Taylor (1965) preselected subjects by using the Overcontroller-Under-controller Hostility Inventory developed by Saltz (1962). He was studying the influence of provocation upon aggression, and he found that undercontrollers showed greater increases in aggressivity over trials than did overcontrollers. Thus, preselecting the subjects provided a means of controlling the variability in the scores found in using randomly selected subjects, and also additional information was gained about the subjects.

In the present study, the instructions were left ambiguous regarding the reaction time part of the procedure. It was expected that the subjects would focus on the administering and receiving of shocks, and that the performing of reaction times would become of secondary importance to them. The ambiguous instructions may have been needlessly unclear, and allowed for too many different interpretations by the individual subjects. For example, one subject could have believed that he was competing with the remaining subjects in his group to give the lowest reaction times, while another subject might have felt that each of the subjects was being rated independently. Future studies should clearly state the expected relationship between the subjects and the various experimental parameters, or at least investigate the effect of leaving the relationships ambiguous or clearly spelling them out. For example, such a study could be done using 30

groups of three subjects each, and a different set of instructions could be given to each 10 groups. The first set of instructions would focus on the need for cooperation among the subjects. The second set of instructions could present the study as a competitive one in which the subjects with the lowest reaction times in each group would receive a reward at the end of the experiment. The third set of instructions would be ambiguous and discuss the study as an investigation of the relationship between reaction time and aggression, as was the case in the present study. The results of such a study would then provide some possible insights into the effects of the different instructional sets.

The operant trials provided information about the subjects' mean aggression levels prior to the beginning of the provocation procedure. During the operant trials, the mean aggression levels of the subjects fell into the order predicted for the experimental trials, i.e., H-M-L, although the High and Medium subjects' scores were quite similar. An immediate question is why the scores fell in this order during the operant trials. One possibility is that, even though standard instructions were used, the experimenters conveyed through their behavior toward the subjects some information about the level of provocation they would later receive. The experimenters could have been more relaxed when facing a Low group than a Medium or High group, and conveyed this relaxed mood in their interaction with the subjects prior to beginning

the experiment. The atmosphere thus created could have led the subjects to choose low levels of shock during the operant trials. Similarly, with the High groups, the experimenters might have been more anxious since they were to administer high shock levels to these subjects, and could have established a tense atmosphere which the subjects picked up and which influenced their early responses. It is not possible now to determine if the experimenters' behavior influenced the subjects' responses during the initial ten trials, but it is clear that in future studies the experimenters should not be aware of the provocation level each group will be administered until the experimental trials begin.

A comparison of the subjects' scores for the operant and post trials indicated that during the post trials, the mean aggression levels of all subjects showed a significant increase over these levels during the operant trials. Although no control group which received no provocation was included in this study, these results can be compared to some extent with those of Mendelsohn (1968), whose study differed from the present study in two aspects. Mendelsohn found no significant increase in his subjects' aggression levels over 25 trials in a free-responding situation, and he concluded that the spiraling of aggression he had predicted had not occurred. The additional 15 trials and hence 15 additional shocks for each subject in the present study could ostensibly have accounted for the significant increases in mean aggression levels of the

subjects. It may be that the subjects became increasingly angry as the shocks continued to come, and chose increasingly higher levels of shock. However, Figure 3 indicates that this is probably not the case. As seen in Figure 3, the highest combined mean scores for all the groups occurred during the first 25 trials, although the highest mean scores for the Low subjects did come during the post trials. It thus appears that the significant increase in the subjects' mean aggression levels was not due to the additional 15 trials in the present study which were not used in Mendelsohn's study.

The other major addition to the present study not found in Mendelsohn's procedure was the provocation variable. It thus seems probable that some aspect of the provocation procedure contributed to an increasing level of aggression among all subjects. If the provocation had been perceived primarily as an attack, as was expected, the subjects would probably have chosen to administer shock levels to their neighbors that closely approximated the shock levels they were receiving, barring the influence of an attitude set as discussed earlier. This hypothesis was not confirmed. If the subjects did not respond primarily to the intensity of the provocation, perhaps they were responding to its invariability. In other words, no matter what response a subject made during the 20 experimental trials, he continued to receive one of two consecutive shock levels in his digital display window, and one intensity of shock. If the subject was trying

to communicate by his choice of shock level, then he could have perceived his communication as not getting through. It is possible then that the experimental trials could have been perceived as an experience in frustration. Dollard et al (1939) defines frustration as: "that condition which exists when a goal response suffers interference" (p. 11). The invariable level of shock received by the subjects during the experimental trials could have been considered as a blocking of the subjects' attempts to reach a goal, the goal of communicating to the other members of the group. This conjecture is not an attempt to comment on the merits of the frustration-aggression hypothesis, since in this case, the only possible responses available to the subjects were on a scale of aggression. It is also possible that the subjects were reacting to the provocation as a combination of being attacked and frustrated. In any event, the addition of the concept of frustration as a possible effect of the provocation procedure provides one possible explanation for the unexpected results in this study.

In the present study, a significant increase in aggression occurred among subjects in groups under conditions of provocation and possibly frustration. The difficulty in ascertaining the specific causal factors of the aggression points out the need in future studies of provocation and aggression in groups for a more thorough evaluation of the subjects prior to and following the experiment, for an

understanding of the effects of different instructional sets, and for a more appropriate means of administering the provocation without confounding its effects with other factors.

There were many uncontrolled factors in this study which could have affected the results, and thus it has probably not been an exhaustive test of the potential effect of provocation upon aggression in a small group. It would seem appropriate to attempt at least one additional study involving the provocation variable with several modifications. First, there should be a careful preselection of subjects, perhaps utilizing such measures as the Overcontroller-Undercontroller Hostility Inventory mentioned earlier. Subjects could be grouped according to their scores on such measures. Also, a questionnaire or semantic differential should be given to tap the subject's attitudes about being in the experiment, both prior to and following the experiment. These attitudes should be a variable in the study. Secondly, the instructional set needs to be controlled. Three sets of instructions could be given to different groups, one set emphasizing the need for cooperation among the subjects, the second emphasizing the competitive aspects of the study, and the third set leaving the relationship between the subjects unclear, as was true in the present study. The experimenters should not be aware of the level of provocation a group is to receive until the provocation procedure begins. The number of provocation trials could be varied to determine if the 20 provocation

trials in the present study led to frustration among the subjects. Groups could be run through 10 operant trials, and then either 10, 15, or 20 provocation trials, followed by 20, 15, and 10 post experimental trials to equate the total trials for each subject. The number of groups of subjects in each provocation condition should be chosen to maximize the power in the analyses of variance which were to be used to analyze the data. Finally, in addition to groups being administered one of three possible levels of provocation, a control group should also be run to which no provocation is administered. If the above study were attempted, it should provide a reasonable test of the effect of provocation upon aggression in a small group.

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